STORMS AND WEATHER WARNINGS

WASHINGTON FORECAST DISTRICT

The month was very quiet as far as storm warnings were concerned. Small-craft warnings were issued on the 16th, 22d, 27th, and 31st for portions of the middle and north Atlantic coast and storm warnings on the evening of the 31st from New Haven to Eastport. The month was characterized by a considerable number of Alberta highs.—*R. H. Weightman.*

CHICAGO FORECAST DISTRICT

The weather in this district was rather warm during the first half of July and cool during the second half; and the month, as a whole, averaged below normal in temperature, except in the extreme western portion of the region.

Rainfall, for the most part, was deficient, and decidedly so in some areas, especially from the Valley of the Red River of the North southward across the middle and lower Missouri Valleys. On the other hand, copious rainfall occurred in portions of the lower Michigan peninsula and the middle upper Mississippi Valley. Weather conditions were not such as to call for general warnings, and only minor advices in the nature of small-craft warnings on the Great Lakes and frost warnings for the cranberry marshes of Wisconsin were sent out on a few occasions.

In addition to the regular forecasts, special forecasts were made for the forest interests of western Montana and for the fruit spraying interests of southwestern lower Michigan and Door County, Wis.

The forecaster was called upon on two different occasions to make special predictions which seem worthy of note:

1. For the Chicago-Mackinac Island cruiser race.
2. Flying weather for night flight of six Army airplanes en route from Cheyenne to Chicago.

The cruiser race started from Chicago on the afternoon of Saturday, July 25, there being about 20 entries, sloops, schooners, and yawls; and on the morning of that day a special winds and weather forecast was made covering the course down Lake Michigan for the period ending Monday night, and special forecasts twice daily thereafter until the morning of the 28th. The forecast was for northerly winds following the time of the start, probably becoming fresh, and forecasts for continued head winds were made in the later issues. These were broadcast widely by radio, so that boats equipped with receiving sets might pick them up during the race. In consequence of the continuation of head winds, the boats did not reach Mackinac Island, their destination, until much later than usual, being approximately three days in transit. The predictions were well verified and much appreciated.

The commander of a group of six Army pursuit airplanes, desiring to make a test flight by night from Cheyenne, Wyo., to Chicago, wired the Chicago forecaster July 28 an inquiry as to good weather for night flying. Because of the large number of planes involved and the desirability of keeping in close formation on the journey, excellent weather was necessary, but local thunderstorms and more or less unsettled conditions were prevailing along the route. The commander at Cheyenne was so advised on the 28th and 29th. On the 30th, when conditions seemed to be improving from Cheyenne eastward almost to the Mississippi River, he was informed that comparatively clear conditions would prevail over that area, but that the weather would be mostly overcast in northern Illinois; and that the wind aloft, from 2,500 to 3,000 meters, would be favorable carrying winds. The trip was made that night, the 30th, and all planes landed safely at the flying field near Chicago, except one, which was forced down because of engine trouble.—*H. J. Cox.*

NEW ORLEANS FORECAST DISTRICT

Moderate weather conditions prevailed over the west Gulf district during July, marked, however, by persistent drought over much of Texas and parts of Oklahoma and Louisiana. No storm warnings were ordered during the month, and no storm occurred on the west Gulf coast.—*I. M. Cline.*

DENVER FORECAST DISTRICT

The usual midsummer conditions prevailed, with frequent showers and thunderstorms in about all portions of the district except western Arizona. Occasional heavy downpours occurred during the last decade of the month in eastern Colorado and New Mexico. Temperatures averaged considerably above normal.

No special warnings, except flood warnings, were required.—*J. M. Sherier.*

SAN FRANCISCO FORECAST DISTRICT

July gave no exceptional weather conditions in this district other than a period of abnormally high temperatures in the interior during the middle of the month, attended by exceptionally high temperatures at many interior reporting stations, and resulting in the recording of higher readings than had been previously registered at a number of points in the Central Valley of California and at some of the stations in Nevada and southern Idaho. The oncoming of the heat wave was indicated by the regular forecasts and by special warnings disseminated when the fire hazard in the forested areas was expected to make fires easy to start and difficult to suppress. These advices now go by telegraph, telephone, or radio-telephone to those interested, and it is reported that they are most helpful.

Precipitation was light and local, as a rule, and attended by thunderstorms in nearly all instances. No cyclonic storms approached this district from the Pacific, although near the end of the month a disturbance of moderate intensity was off the Washington-Oregon coast and there were indications that it would move eastward and cross the coast line near Puget Sound. Instead, it moved northward and did not affect the weather conditions in any region except the Washington coast, where it produced light rains and strong southerly winds.—*E. H. Bowie.*

RIVERS AND FLOODS

By R. E. SPENCER

Low water.—Owing to the continued dryness of the summer, unusually low stages occurred in some of the rivers of the South, and the Mississippi, after a rise from the extreme low water of May and June, began dropping again about the middle of July and was still falling steadily at the end. Low-water records for this month were closely approached in the upper Tombigbee and Red Rivers; and in the Tennessee and lower Arkansas Rivers, where the condition was especially marked, stages fell lower at several stations than in any previous July of record. The following table gives comparative low stages for July on the two latter rivers:

Low water in July on Tennessee and lower Arkansas Rivers—1925 compared with previous record

Station	River	July, 1925, low-water record		Previous July low-water record	
		Stage	Date	Stage	Date
Knoxville, Tenn	Tennessee	−0.8	31	−0.5	1911
Loudon, Tenn	do	0.4	30–31	−0.5	1914
Rockwood, Tenn	do	2.5	31	4.2	1923
Chattanooga, Tenn. (pool stage, 6 feet)	do	6.9	25	0.8	1879
Hales Bar, Guild, Tenn., above dam (pool stage 37.5 feet)	do	39.0	25	6.9	1913
Hales Bar, Guild, Tenn., below dam	do	0.6	26	1.7	1914
Bridgeport, Ala. (pool stage 0.6 foot)	do	−0.2	26	0.1	1899, 1914
Guntersville, Ala	do	0.6	28	4.2	1906
Decatur, Ala	do	0.2	31	0.2	1878
Upper Muscle Shoals, Ala	do	1.6	29–31	0.7	1899
Florence, Ala	do	−1.2	31	−0.7	1898
Riverton, Ala	do	6.8	31	7.4	1899
Savannah, Tenn	do	0.5	26	5.1	1922
Johnsonville, Tenn	do	0.7	8–9	0.5	1879, 1914
Little Rock, Ark	Arkansas	−1.8	[1] 19	−1.6	1918
Pine Bluff, Ark	do	1.9	17–18	2.3	1918

[1] And subsequent dates.

Floods.—While heavy and widely scattered local rainfall continued, as in June, to cause floods of minor destructiveness in creeks and small streams, the only rise of consequence in an important river was that following the 21st of July in the Purgatoire of Colorado. This flood, resulting from heavy rain in the upper reaches of the river, did damage estimated at $43,400, of which $3,000 was in crops. No damage was reported from other floods in the Southwest.

The annual rise in the Columbia River finally subsided in early July. Owing to high temperature in April the rise began unusually early this year, but it was temporarily retarded before making important headway by a period of cold lasting about 10 days in the latter part of the month. During this period stages at several stations fell practically to the starting point; but beginning late in April and continuing for most of the next month the weather was again warm, with the result that the rise was steady and crests reached at all stations on the river in the last decade of May. The slight secondary rise which occurred in the latter part of June was without importance.

Columbia River water backing into the channel of the Willamette kept the latter above flood stage at Portland, Oreg., from April 20 to 24 and again from May 15 to July 6.

As to warnings for and damage by the flood, the official in charge of the Weather Bureau office at Portland, Oreg., reports as follows:

During the rise warnings were issued from day to day, giving advice as to stages that might be expected from three days to a week in advance, and so far as is known all movable property was saved in Portland and such movable property as was lost in other sections was mostly because of breaking of dikes, etc., and not because of lack of warnings. Losses reported to this office were as follows:

Tangible property	$18,525
Matured crops (mostly pasture)	9,700
Prospective crops	44,540
Movable property	17,595
Suspension of business, etc	6,050
Miscellaneous	225
Total	96,635

This office has statistics of property saved by the flood warnings amounting to $170,500, and it is known that the actual amount saved is much greater than this, for many patrons report that they saved entire stocks of goods without giving the value of the stocks.

On May 27, 1925, the new channel of the Arkansas River through the city of Pueblo, Colo., was opened. This channel, whose purpose is primarily to prevent future damaging overflow in the city, is roughly 3 miles long with a fall of 12 feet per mile, is adequately banked on the south by a natural 60 to 80 foot bluff and on the north by a 32-foot levee, and will accommodate at its narrowest point a discharge of 125,000 cubic feet of water per second—practically three times the capacity of the old channel.

For regulation of flow in the new channel and as a further measure for flood protection for the city, a barrier known as the Rock Creek Barrier is being constructed in the Arkansas channel, at right angles to its direction, 6½ miles above Pueblo. The combined length of this barrier and a 50-foot earth embankment of which it will be virtually a continuation, will be 3,000 feet. Openings will provide for a maximum flow through the completed structure of 100,000 cubic feet per second, as follows: 80,000 by the natural channel, 14,000 at the Denver & Rio Grande Western Railroad tracks, and 6,000 at the Bessemer ditch.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
Mississippi drainage					
	Feet			Feet	
Arkansas: Fort Lyon, Colo	6	21	[1] 24	7.3	23
Purgatoire:					
Trinidad, Colo	10	[1] 22	[1] 22	13.3	22
Higbee, Colo	4.5	[1] 21	[1] 23	5.6	23
Canadian: Logan, N. Mex	4	[1] 22	[1] 29	10.0	27
West Gulf drainage					
Pecos: Fort Sumner, N. Mex	7	[1] 23	-------	8.0	23
Pacific drainage					
Colorado: Parker, Ariz	7	(2)	5	7.6	June 28–30
Columbia: Marcus, Wash	24	(2)	16	30.4	May 26
Willamette: Portland, Oreg	15	(2)	5	21.7	May 26

[1] Date uncertain. [2] Continued from last month.

MEAN LAKE LEVELS DURING JULY, 1925

BY UNITED STATES LAKE SURVEY

[Detroit, Mich., Aug. 5, 1925]

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes [1]			
	Superior	Michigan and Huron	Erie	Ontario
	Feet	Feet	Feet	Feet
Mean level during July, 1925:				
Above mean sea level at New York	601.39	578.52	571.11	245.21
Above or below—				
Mean stage of June, 1925	+0.17	+0.08	−0.08	−0.21
Mean stage of July, 1924	+0.07	−1.01	−1.33	−1.00
Average stage for July last 10 years	−1.03	−2.27	−1.67	−1.40
Highest recorded July stage	−2.43	−5.06	−3.30	−3.51
Lowest recorded July stage	+0.07	−1.01	−0.35	+0.62
Average departure (since 1860) of July level from June level	+0.21	+0.06	−0.03	−0.02

[1] Lake St. Clair's level: In July, 1925, 573.81 feet.